SCIENCE.

FRIDAY, NOVEMBER 21, 1884.

COMMENT AND CRITICISM.

WE OFTEN hear it said, that any thing is easy to do when one only knows how; but the transition from doing to speculating involves in some way the inverse of this; for what is easier than unending conjecture to the wilfully ignorant theorizer? Astronomers and physicists, armed with powerful telescopes and spectroscopes, have for years been assiduously occupied with the careful and systematic study of all the visible phenomena of the solar disk, and have been able to obtain satisfactory solutions of many problems of great difficulty. For the pretentious pseudo-scientist, however, all these labors have been in vain. His own theories preclude all need of investigation, and the facts must be manipulated into coincidence with his vagaries. But there still remains a host of mysteries in the field of the physics of astronomy which all observation and reasonable hypothesis have so far failed to unravel. Do these harass the soul of the pseudo-scientist? Far from it. Not only is he ready to urge on every occasion 'the true theory,' and to prove that his is 'the only possible solution,' but he rashly confronts all existing science with unanswerable clinchers, in this wise: "Where, then, shall we turn for a theory, if we reject the one herein developed, . . . *the non-admission of which will forever involve science in difficulties and inconsistencies?*"

We have a doubt whether we do not owe our readers an apology for space given up to such a book as that noticed in another column of this issue; but it gives us excuse for correcting the impression, more or less prevalent among those indirectly interested in the progress of American science, that the crop of pseudo-scientific literature is larger in our own country than it is abroad. The scientific 'crank,' like all of that ilk, is perpetually clamoring for recognition; and, as he ever and anon acts upon his belief that the acknowledged leaders in science are most easily accessible through their mails, this impression is speedily corrected on examination of the sources of the contents of a few waste-baskets. The more thorough and wide-spread scientific education afforded in many foreign countries is not apparently, as we should expect, the means of turning the energies of the 'crank' into the direction of legitimate research; but he enjoys his frequent appearance in type with a freedom which the American pseudo-scientist only rarely indulges.

We may take this occasion to comment further on the very unwise precedent which the publishers of this book have set by the issue of a work of this character. Book-publishing has for a number of years been conducted on a very scientific basis by a few of the better-known houses, and only such works have been issued as were able to pass muster with the critical 'reader' or expert. The greatest of care has been exercised, that the publication of no book should be undertaken the sales of which were not likely to be reasonably remunerative. Such care has greatly lessened the labors of large buyers of books, and inspired them with a very proper confidence in the best houses; so that, in fact, not a few libraries have standing orders with certain publishers for every book as soon as issued, and the book-buyer has heretofore been usually safe against serious imposition. When, however, an accumulation of literary refuse comes on the market, bearing the imprint of a reputable house, it becomes an appropriate season for the display of cautionary signals.

THE *Monthly weather-review* of the signal-service for last August shows an important

change in the right direction on its cover. Heretofore these valuable summaries, involving a great amount of labor quite apart from the preparation of daily forecasts, have been issued anonymously; at least, it has been simply announced that they were "prepared under the direction of . . . the chief signal-officer of the army." There is now very properly added to this the name of the officer personally in charge of the work. The more direct the statement of individual authorship, the better; for with it goes individual credit and responsibility. The 'Professional papers' and the 'Notes of the signal-service' have always been thus duly credited to their authors: it would be well if the authorship of the many circulars that have been issued on tornadoes, thunder-storms, and other subjects, had been as explicitly published.

The terminology of storms adopted in these reviews is somewhat open to criticism. After forty years of observation, during which it has always been found that regions of low barometric pressure are accompanied by an inward flow of the winds, with a constant direction of spiral turning, it does not seem hasty to use a *name* for such phenomena, and call them briefly 'cyclones,' as was long ago suggested, so as to avoid the awkward paraphrase, 'area of low barometer,' on the one hand, and the abrupt slangy expression, 'low,' on the other, and do away with so erroneous a description as 'atmospheric depression,' and with so indefinite a term as 'disturbance.' It is an incorrect use of the word that associates cyclones only with hurricanes of devastating strength, or with local storms like tornadoes. It was originally proposed, and should still be used, to designate a certain kind of atmospheric mechanism, independent of gentleness or violence, and hence perfectly applicable to the 'disturbances' in question.

Redfield was clearly of this opinion. In 1854 he wrote that the term 'cyclone' was proposed "to designate any considerable area or extent of wind which exhibits a turning or revolving motion, without regard to its varying velocity, or to the different names which are often applied to such winds. . . . All hurricanes or violent storms may, perhaps, be considered as cyclones or revolving winds; but it by no means follows that all cyclones are either hurricanes, gales, or storms." He said, further, that the word was not designed to express the degree of activity or force of the wind, and made mention of "the inert and passive cyclones which seldom gain attention." Similar abstracts could be made from Col. Reid's famous work on the 'Law of storms;' and, even in the early numbers of the *Weather-review*, 'cyclone' was used in its original sense. It would be advisable to return to it.

By means of a most promising local anaesthetic, Dr. Koller of Vienna has recently been able to render the eye quite insensible to pain. Under its influence, almost any operation may be performed upon this delicate organ without causing suffering; and its use is not followed by unpleasant after-effects. A few minutes after putting three or four drops of a four-per-cent solution of hydrochlorate of cocaine into the eye, no discomfort is felt when the front of the eyeball is rubbed with the finger; or it may be cut with a knife, for example, to do an operation for cataract, and no pain is occasioned. It is not many weeks since this was demonstrated in Germany; and already many operations have been performed by our own oculists with great success and satisfaction. For some months before its use in the eye, it had been employed by physicians to render the mucous membranes less sensitive, especially that of the throat; and it will probably be found capable of rendering other valuable services in medicine.

The alkaloid cocaine, which was isolated about thirty years ago by Gardeke, and is somewhat similar to the one which is found in tea and coffee, is obtained from the leaves of the Erythroxylon coca. This shrub is cultivated in the valleys of the eastern slopes of

the Andes; and its leaves, which are gathered and dried with great care, have been used by the natives as a stimulant and narcotic since the days of the Incas, by whom it was held in great esteem. This plant should not be confounded with the more familiar Theobroma cacao, the seeds of which afford chocolate and cacao-butter, nor with the cocoanut, whose tree supplies food, drink, light, clothing, and shelter to the natives of some tropical lands.

LETTERS TO THE EDITOR.

*** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

The stone age in prehistoric archeology.

IN a recent number of *Science*, it is stated (p. 438), that at a meeting of the Academy of natural sciences of Philadelphia, Sept. 25, Dr. Brinton exhibited certain stone objects from Tunis, presented by the Marquis de Nadaillac. Among them was one resembling the 'stemmed scrapers' found in this country. "This form," the writer goes on to state, "is characteristic, in France, of the *later* productions of the stone age, especially of that epoch called by the French archeologists 'the epoch of Robenhausen.' Chronologically, this is regarded as the first epoch of the appearance of man on the globe, the previous implement-using animals being probably anthropoids." This is a most amazing travesty of the views of de Mortillet and the archeologists of his school. It may safely be asserted that no one holds any such opinions as these, with the possible exception of the writer of the notice in question.

At the Prehistoric congress held at Brussels in 1872, Gabriel de Mortillet first proposed his system of classification of the age of stone. In it the name 'epoch of Robenhausen' is given as synonymous with 'age of polished stone,' or 'neolithic period;' while the paleolithic age is subdivided into four grand divisions, called, in the inverse order of their antiquity, those of La Madelaine, of Solutré, of Moustier, and of St. Acheul, each characterized by its own peculiar type of instrument. This classification was still further extended by him to the age of bronze, in a table exhibited at the Geographical congress held at Paris in the summer of 1875. A full account of it was given in the *Matériaux*, vol. x. p. 372. Since then the system has been almost universally adopted by prehistoric archeologists; and it is thoroughly explained and admirably illustrated in the 'Musée préhistorique,' published by Messrs. Gabriel and Adrien de Mortillet, in 1881. In 1883 the elder de Mortillet published, in the library of contemporary sciences, his 'Le préhistorique antiquité de l'homme.' In this the views he was known to hold in regard to the so-called 'tertiary man,' or, as he more logically entitles him, 'the precursor of man,' are set forth in detail. A critical notice of this work was given by the writer in *Science* for March 30, 1883. The work is divided into three parts, — 'the tertiary man,' 'the quaternary man,' and 'the man of the present' (*homme actuel*); and the doctrine is maintained that "it is only at *the commencement of the quaternary* that man shows himself not absolutely identical with us, but so near that we cannot refuse to him, under a proper nomenclature, the name of man." De Mortillet's peculiar views, with which only a very few anthropologists sympathize, are confined to the existence of an intelligent 'implement-using anthropoid' in tertiary times. To this question he returns with renewed vigor in his journal, *L'homme*, of the 25th of last September, apropos of the excavations made at the celebrated locality of Thenay (near Tours) by a committee of the French association for the advancement of science. These were preparatory to a discussion of the question of the tertiary man at the meeting held last year at Blois.

Whether it was 'man,' or 'an intelligent anthropoid,' who fabricated stone implements in tertiary times, may well be a question; but there is no doubt whatsoever that they were men very like those first found by Europeans on this continent, and Mr. Jacob Messikommer will help any one, as he did the writer, to disinter their relics from the peat-moor of Robenhausen.

HENRY W. HAYNES.

Boston, Nov. 10.

Forgotten conclusions of science.

Your comments on the forgotten conclusion of an investigator on rectal anaesthesia reminds me of a discussion, in the section of physics at the American association, over a paper of Professor Graham Bell's, on a possible method of communication between ships at sea. Several eminent men and some distinguished foreign visitors took part in the discussion. It led out into suggestions of telegraphing across the ocean without wires, and experiments of communication across rivers, and across the strait between Southampton and the Isle of Wight.

As my recollection serves me, Professor Morse went over all these experiments more than thirty years ago, and supposed at one time he could carry his telegraph across rivers and streams by means of two wires, one running up and the other down stream along the shores, and then dipping into the water. I remember seeing a cut illustrating it. Professor Bell's paper was a new adaptation of the old idea; but the discussion, and all, seemed to me to be wholly oblivious of the experiments and conclusions of Professor Morse.

P. J. FARNSWORTH.

Clinton, Io., Nov. 8.

The lamprey as a builder.

During the month of June I had an excellent opportunity to observe the manner in which the lamprey eel (Petromyzon marinus) builds a stone dam for the deposit of spawn and for the protection of the progeny.

The location of the structure was in the Saco River, within the ripples near the foot of the lower falls, three miles from the sea, and near the level of mean high water. It was nearly at right angles with a shore-wall of granite, and was about fifteen feet long and from one to three feet in height. Its position and triangular shape in vertical section were well adapted for securing a change of water, and a hiding-place among the stones for the young.

When I first noticed the movements of the eels, they were diligently at work, their system of operation being very methodical; but I was not able to determine whether there was any action by single pairs, as